SOX10

Common genetic pathways

Construction of *Sox10^{Dom}*/+ congenic lines identified **a modifier of *Sox10^{Dom}*/+ hypopigmentation on mouse Chromosome 10**, in the same region as an *Ednrb* hypopigmentation modifier (Southard-Smith et al., 1999).

***Sox10*^{tm1Weg} mice were used in an ENU mutagenesis screen to sensitize offspring to alterations in neural crest-derived tissues that are dependent on SOX10 function, thus allowing identification of two new genes that regulate neural crest-derived melanocyte development**. Postnatal screening for increased hypopigmentation defects identified a mutation in the hedgehog-signaling mediator *Gli3*, demonstrating the importance of *Gli3* in melanoblast function (Matera et al.,2008). Of note, embryonic screening for altered development of LacZ-expressing tissues in *Sox10*^{tm1Weg} mice was also able to identify genes regulating development of other neural crest-derived tissues in which SOX10 plays an important function, as was shown in the identification of the receptor tyrosine kinase ERBB3 as regulating cranial and sympathetic ganglia formation (Buac et al.,2008).

Targeted insertion of GFP at the *Sox10* locus allowed identification of *Sox10*-expressing neural crest cells from ES cell cultures. Generation of mouse chimeras demonstrated that the *Sox10-GFP* construct showed GFP expression in neural crest-derived tissues. **The various growth factors needed to support *Sox10*-positive cell maintenance or expansion were determined**, with differentiation potential being measured by neuronal differentiation and ganglia colonization of the gut (Kawaguchi et al., 2010).